

**SOUTH CAROLINA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
AIR POLLUTION CONTROL REGULATIONS AND STANDARDS**

**REGULATION 61-62.5
AIR POLLUTION CONTROL STANDARDS**

**STANDARD NO. 4
EMISSIONS FROM PROCESS INDUSTRIES**

SECTION I - GENERAL

A. The method which is approved by the Department for determining compliance with opacity limitations under this Standard is EPA Reference Method 9 (40 CFR 60, Appendix A, as revised July 1, 1984). Alternate methods may be utilized only if approved in advance by the Department and by the Environmental Protection Agency.

B. This standard will not supersede any requirements imposed by Federal New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, Federal or State Prevention of Significant Deterioration Regulations, nor special permit conditions, unless this Standard would impose a more restrictive emission limit.

SECTION II - SULFURIC ACID MANUFACTURING

A. The rate of emission of sulfur dioxide from sulfuric acid manufacturing shall be limited to no more than 4 pounds of sulfur dioxide per ton of 100% sulfuric acid produced and emissions of acid mist to 0.5 pounds of sulfuric acid per ton of 100% acid produced.

B. The maximum allowable stack outlet opacity from any source under this category is 20%.

SECTION III - KRAFT PULP AND PAPER MANUFACTURING

The rate of emissions from kraft pulp and paper manufacturing shall be limited to the following:

	Maximum allowable Stack Opacity	Maximum allowable emissions of particulate matter in pounds/equivalent ton of air dried, unbleached pulp produced
Recovery Furnace	40%	2.75
Dissolving Tank	20%	1.0
Lime Kiln	20%	1.0

SECTION IV - PORTLAND CEMENT MANUFACTURING

A. The rate of emissions of particulate matter from Portland cement manufacturing shall be limited to the following:

Production Rate Per Kiln (Tons per Hour)	Maximum Allowable Emissions of Particulate Matter Per Kiln (Pounds per Hour)
10	14
15	18
20	22
25	25
30	29
50	40
60	42
80	45
100	47
120	48

B. Opacity from Portland Cement Manufacturing shall be limited to the following:

Source	Maximum Allowable Stack Opacity
Kiln	20%
Clinker Cooler	20%
Marl Dryer	20%

SECTION V - COTTON GINS

A. Particulate matter emission from cotton gins shall be limited to the maximum rate specified in the table below.

Production Rate (Output) Bales* Per Hour	Maximum Allowable Rate of Particulate Matter Emissions (Pounds Per Hour)
4	12.3
5	14.4

Production Rate (Output) Bales* Per Hour	Maximum Allowable Rate of Particulate Matter Emissions (Pounds Per Hour)
6	16.2
7	18.0
8	19.5
9	21.2
10	22.8
11	24.2
12	25.8
13	27.1
14	28.5
15	29.9
16 and above	31.2

*For the purpose of this standard a bale is defined as a finished bale weighing 500 pounds.

B. The maximum allowable opacity from cotton ginning operations shall be 20%.

SECTION VI - HOT MIX ASPHALT MANUFACTURING

A. The rate of emissions of particulate matter from hot mix asphalt manufacturing shall be limited to the following:

Production Rate (Tons Per Hour)	Maximum Allowable Emission Rate (Pounds Per Hour)
20	22
50	31
100	38
150	45
200	51
250	56
300	61
350 and above	65

B. All hot mix asphalt plants shall be equipped with a fugitive dust and/or fugitive emissions control system which shall be operated and maintained in such a manner as to reduce to a minimum the emissions of particulate matter from any point other than the stack outlet.

C. The maximum allowable stack opacity from hot mix asphalt manufacturing shall be 20%.

SECTION VII - METAL REFINING

The maximum allowable opacity from any furnace building and/or operations building (including but not limited to pollution control systems, louvers, doors, openings, etc.) shall be 20%.

SECTION VIII - OTHER MANUFACTURING

A. Particulate matter emissions where not specified elsewhere shall be limited to the rate specified in Table A (modified using the effect factors (F) of Table B as required).

B. Interpolation of the data in this table for process weights up to 30 tons per hour shall be accomplished by use of the equation:

$$E = (F) 4.10 P^{0.67}$$

and interpolation and extrapolation of the data for process weight rates greater than 30 tons per hour shall be accomplished by using the equation:

$$E = (F) (55.0 P^{0.11} - 40)$$

Where: E = the allowable emission rate in pounds per hour,
P = process weight rate in tons per hour.
F = effect factor from Table B.

TABLE A
ALLOWABLE RATE OF EMISSION BASED ON PROCESS WEIGHT RATE *

Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)	Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)
0.05	0.551	8	16.5
0.10	0.877	9	17.9
0.20	1.40	10	19.2
0.30	1.83	15	25.2
0.40	2.22	20	30.5
0.50	2.58	25	35.4
0.75	3.38	30	40.0

Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)	Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)
1.00	4.10	35	41.3
1.25	4.75	40	42.5
1.50	5.38	45	43.6
1.75	5.96	50	44.6
2.00	6.52	60	46.3
2.50	7.58	70	47.8
3.00	8.56	80	49.0
3.50	9.49	100	51.2
4.00	10.4	500	69.0
4.50	11.2	1000	77.6
5.00	12.0	3000	92.7

* Please note that certain small operations may not require a permit (see exemptions under Regulation 62.1, Section II).

TABLE B
EFFECT FACTOR FOR PARTICULATE MATTER EMISSIONS **
(TO BE USED WITH STANDARD 4 - SECTION VIII)

Material	Effect Factor (F)
a. All materials not specifically listed herein	1.0
b. Elements and their compounds on basis of the element contained therein***	none assigned
c. Specific Materials Acid Mists	0.25

** The Board will make additions to this table as required from time to time to preserve public health and property in South Carolina.

*** When a material contains two or more elements, the effect factor of the element having the lower effect factor shall apply.

SECTION IX - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)

A. Where construction or modification began on or before December 31, 1985, emissions (including

fugitive emissions) shall not exhibit an opacity greater than 40%.

B. Where construction or modification began after December 31, 1985, emissions (including fugitive emissions) shall not exhibit an opacity greater than 20%.

SECTION X - NON-ENCLOSED OPERATIONS

A. All non-enclosed operations shall be conducted in such a manner that a minimum of particulate matter becomes airborne. In no case shall established ambient air quality standards be exceeded at or beyond the property line.

B. The owner or operator of all such operations shall maintain dust control of the premises and any roadway owned or controlled by the owner or operator by paving, or other suitable measures. Oil treatment is prohibited.

C. All crushing, drying, classification and like operations shall employ a suitable control device acceptable to the Department, and shall discharge no more particulate matter than that specified in Section VIII of this Standard.

SECTION XI - TOTAL REDUCED SULFUR EMISSIONS OF KRAFT PULP MILLS

A. Applicability and Designation of Affected Sources

1. The provisions of this subpart are applicable to the following affected sources in kraft pulp mills which commenced construction prior to September 24, 1976: digester system, brown stock washer system, multiple-effect evaporator system, black liquor oxidation system, recovery furnace, smelt dissolving tank, lime kiln, and condensate stripper system.

2. The effective date of this section is February 22, 1980.

B. Total Reduced Sulfur Emission Standards

The rate of total reduced sulfur emissions from existing kraft pulp mills shall be limited to the following:

	Maximum allowable emission of TRS as H ₂ S by dry volume, averaged over 12 hours
Recovery Furnace	
Cross Recovery furnaces	25 ppm (corrected to 8% oxygen)
Old Design Furnaces ¹	20 ppm (corrected to 8% oxygen)
New Design Furnaces ²	5 ppm (corrected to 8% oxygen)
Digester System	5 ppm
Multiple-Effect Evaporator System	5 ppm
Lime Kiln	20 ppm (corrected to 10% oxygen)
Brown Stock Washer system	no control

	Maximum allowable emission of TRS as H ₂ S by dry volume, averaged over 12 hours
Black Liquor Oxidation System	no control
Condensate Stripper System	5 ppm
Smelt Dissolving Tank	0.016 g/kg BLS ³

¹ old design furnaces are defined as furnaces without welded wall or membrane wall construction or emission-control designed air systems.

² New design furnaces are defined as furnaces with either welded wall or membrane wall construction and also with emission-control designed air systems.

³ Black liquor solids (dry weights).

C. Case-by-Case Exceptions to Provisions of Part B.

1. If the owner or operator of a source of total reduced sulfur compounds regulated by this standard can demonstrate that compliance with applicable portions of Part B would not be economically feasible, the Department may, on a case-by-case basis, allow emission limitations less stringent than those required by applicable parts of Part B.

All data pertinent to the showing of economic infeasibility must accompany a petition for this relief, and shall include a present value analysis showing economic infeasibility.

2. Exceptions granted under this part are not effective until submitted to and approved by the Administrator of the United States Environmental Protection Agency as a revision of the Implementation Plan for Control of Designated Pollutants, pursuant to Section 111(d) of the Clean Air Act as amended November 1990.

D. Monitoring, Recordkeeping and Reporting

1. The owner/operator shall:

a. calibrate, maintain and operate continuous monitoring equipment to monitor and record the concentration of TRS emissions on a dry basis and the percent of oxygen by volume on a dry basis in the gases discharged into the atmosphere from any lime kiln, recovery furnace, digester system, multiple-effect evaporator system, or condensate stripper system, except where these gases are subjected to a minimum temperature of 1200⁰ F for at least 0.5 seconds in an incinerator or other device which does not generate TRS. The location of each monitoring system must be approved by this Department.

b. install, calibrate, maintain, and operate a monitoring device which measures the combustion temperature at the point of incineration of effluent gases which are emitted from any lime kiln, recovery furnace, digester system, multiple-effect evaporator system, or condensate stripper system unless TRS monitors are required in paragraph a. The monitoring device is to be certified by the manufacturer to be accurate within ± 1 percent of the temperature being measured.

c. calibrate, maintain and operate continuous monitoring equipment for any smelt dissolving tank,

(i) for the continuous measurement of the pressure loss of the gas stream through the control equipment. The monitoring device is to be certified by the manufacturer to be accurate to within a gauge

pressure of ± 2 inches water;

(ii) for the continuous measurement of the scrubbing liquid supply pressure to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ± 15 percent of design scrubbing liquid supply pressure. The pressure sensor or tap is to be located close to the scrubber liquid discharge point. The Department may be consulted for approval of alternative locations;

Continuously monitored operating and/or stack parameters may be used as substitutes for TRS monitors provided that it is demonstrated to the satisfaction of this Department that a correlation exists between the monitored parameter and TRS concentration and the other requirements in paragraph D.1. are fulfilled.

Alternative equivalent methods of monitoring must be approved by this Department and EPA.

2. Any owner or operator subject to the provisions of this SECTION shall:

a. calculate and record on a daily basis 12-hour average TRS concentrations for the two consecutive periods of each operating day. Each 12-hour average shall be determined as the arithmetic mean of the appropriate 12 contiguous 1-hour average total reduced sulfur concentrations provided by each continuous monitoring system installed under paragraph D.1.a.;

b. calculate and record on a daily basis 12-hour average oxygen concentrations for the two consecutive periods of each operating day for the recovery furnace and lime kiln. These 12-hour averages shall correspond to the 12-hour average TRS concentrations under paragraph D.2.a. and shall be determined as an arithmetic mean of the appropriate 12 contiguous 1-hour average oxygen concentrations provided by each continuous monitoring system installed under paragraph D.1.a.;

c. correct all 12-hour average TRS concentrations to 10 volume percent oxygen, except that all 12-hour average TRS concentrations from a recovery furnace shall be corrected to 8 volume percent using the following equation:

$$C_{\text{corr}} = C_{\text{uncorr}} \times (21 - X / 21 - Y)$$

where: C_{corr} = the concentration corrected for oxygen.
 C_{uncorr} = the concentration uncorrected for oxygen.
 X = the volumetric oxygen concentration percentage to be corrected to (8 percent for recovery furnaces and 10 percent for lime kilns, incinerators, or other devices).
 Y = the measured 12-hour average volumetric oxygen concentration.

3. Each owner or operator required to install a continuous monitoring system shall submit a written report of excess emissions (as defined in applicable subparts) to the Department for every calendar quarter unless specified on a more frequent cycle by the Department. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter and shall include the following information:

a. for emissions from any recovery furnace, periods of excess emissions are all 12-hour average TRS concentrations above 20 ppm by volume for old design recovery furnaces, 5 ppm by volume for new design recovery furnaces and above 25 ppm by volume for cross recovery furnaces;

b. for emissions from any lime kiln, periods of excess emissions are all 12-hour average TRS concentrations above 20 ppm by volume;

c. for emissions from any digester system, multiple-effect evaporator system, or condensate stripper system periods of excess emissions are:

(i) all 12-hour average TRS concentrations above 5 ppm by volume unless the provisions of D(1)(a) apply; or

(ii) all periods in excess of 5 minutes and their duration during which the combustion temperature is less than 1200⁰ F if the gases are combusted in an incinerator or other device which does not generate TRS.

4. The Department will consider periods of excess emissions reported under Subpart D.3. of this section to be indicative of a violation if:

a. the number of 12 hour exceedances from recovery furnaces is greater than 1% of the total number of contiguous 12 hour periods in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the recovery furnace is not operating).

b. the number of 12 hour exceedances from lime kilns is greater than 2% of the total number of contiguous 12 hour periods in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the lime kiln is not operating).

c. the number of 12 hour exceedances from incinerators is greater than 2% of the total number of contiguous periods in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the incinerator is not operating).

d. the Department determines that the affected equipment, including air pollution control equipment, is not maintained and operated in a manner which is consistent with good air pollution control practice for minimizing emissions during periods of excess emissions.

SECTION XII - PERIODIC TESTING

A. Particulate Matter Emissions and/or Sulfur Dioxide (SO₂)

An owner or operator of a source listed below shall perform scheduled periodic tests for particulate matter emissions and/or sulfur dioxide every two years except as noted, or on a schedule as stipulated by special permit conditions, and shall ensure that source tests are conducted in accordance with R.61-62.1, Section IV, Source Tests.

1. Recovery furnaces and lime kilns of pulp and paper mills. Smelt tank vents will be required to be tested every four years.

2. Rotary kilns, clinker coolers, and rotary dryers of Portland Cement plants.

3. Sulfuric acid plants.

4. Metallurgical furnaces greater than 10 tons/hr. normal output.

5. Asphalt plants. Asphalt plants that have a baghouse operating in a satisfactory manner with sufficiently low visible emissions may be exempted at the discretion of the Department. Asphalt plants will be required to produce "surface mix" during compliance source testing. "Surface mix" is hot laid

asphaltic concrete surface courses (except sand asphalt surface mix) as defined in Section 403 of the 1986 edition of the South Carolina State Highway Department's "Standard Specifications for Highway Construction" manual. The Department may, at its discretion, waive this requirement if sufficient evidence indicates that less than 25% of the plant's total annual production is surface mix.

6. Fertilizer plants.

7. Any other sources which are deemed necessary.

B. Total Reduced Sulfur (TRS)

An owner or operator of a source which must comply with Section XI must perform scheduled periodic tests for TRS every two years or on a schedule as stipulated by special permit conditions and shall ensure that source tests are conducted in accordance with R.61-62.1, Section IV, Source Tests.

SECTION XIII - [RESERVED]

R. 61-62.5, Standard No. 4 History - *South Carolina State Register*:

Vol. 7, Issue No. 2, (Doc. No. ?), February 25, 1983;
Vol. 7, Issue No. 6, (Doc. No. 314), June 24, 1983;
Vol. 9, Issue No. 5, (Doc. No. 457), May 24, 1985;
Vol. 13, Issue No. 2, (Doc. No. 868), February 24, 1989;
Vol. 12, Issue No. 4, (Doc. No. 970), April 22, 1988;
Vol. 22, Issue 6, (Doc. No. 2244), June 26, 1998;
Vol. 25, Issue No. 10, (Doc. No. 2648), October 26, 2001.